CLAIMS

What is claimed is:

1. A method of incrementally maintaining algebraic functions in automatic summary tables (ASTs) of at least one relational database, said method comprising:

associating a work area with each algebraic function in each AST;

populating variables within each work area for each algebraic function when each AST is created and when each AST is updated;

maintaining each work area by adding and subtracting to and from associated variables of each work area when associated data changes in said relational database; and

computing each algebraic function.

2. The method in claim 1, wherein multiple algebraic functions share the same work area.

3. The method in claim 2, wherein said multiple algebraic function share the same work area when one of:

said algebraic function match exactly;

said algebraic functions match partially; and

said algebraic functions have an intersection.

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4.   The method in claim 1, wherein said computing process comprises recomputing said algebraic function after one or more of said variables have changed.

5.   The method in claim 1, further comprising estimating the error associated with said maintaining process.

6.   The method in claim 5, wherein said error relates to floating point number computations.

7.   The method in claim 1, further comprising adding error variables to said work areas, wherein said error variables comprise estimates of the error in said variables.

8.   A method of updating an automatic summary table (AST), wherein said AST stores derived data from multiple dynamic data tables and said AST comprises multiple algebraic functions, said method comprising:

creating a separate work area for each algebraic function within said AST;

maintaining each work area by adding and subtracting to and from associated variables of each work area when associated data changes in said relational database; and

integrating said changes into said AST by computing each algebraic function.

9.   The method in claim 8, wherein multiple algebraic functions share the same work area.

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10. The method in claim 9, wherein said multiple algebraic function share the same work area when one of:

said algebraic function match exactly;

said algebraic functions match partially; and

said algebraic functions have an intersection.

11. The method in claim 8, wherein said computing process comprises recomputing said algebraic function after one or more of said variables have changed.

12. The method in claim 8, further comprising estimating the error associated with said maintaining process.

13. The method in claim 12, wherein said error relates to floating point number computations.

14. The method in claim 8, further comprising adding error variables to said work areas, wherein said error variables comprise estimates of the error in said variables.

15. A method of incrementally maintaining algebraic functions in automatic summary tables (ASTs) of at least one relational database, said method comprising:

associating a work area with each algebraic function in each AST;

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populating variables within each work area for each algebraic function when each AST is created and when each AST is updated;

maintaining each work area by adding and subtracting to and from associated variables of each work area when associated data changes in said relational database; and

recomputing said algebraic function after one or more of said variables have changed.

16. The method in claim 15, wherein multiple algebraic functions share the same work area.

17. The method in claim 16, wherein said multiple algebraic function share the same work area when one of:

said algebraic function match exactly;

said algebraic functions match partially; and

said algebraic functions have an intersection.

18. The method in claim 15, further comprising estimating the error associated with said maintaining process.

19. The method in claim 18, wherein said error relates to floating point number computations.

20. The method in claim 15, further comprising adding error variables to said work areas, wherein said error variables comprise estimates of the error in said variables.

21.   A program storage device readable by computer, tangibly embodying a program of instructions executable by the computer to perform a method of incrementally maintaining algebraic functions in automatic summary tables (ASTs) of at least one relational database, said method comprising:

associating a work area with each algebraic function in each AST;

populating variables within each work area for each algebraic function when each AST is created and when each AST is updated;

maintaining each work area by adding and subtracting to and from associated variables of each work area when associated data changes in said relational database; and

computing each algebraic function.

22.   The program storage device in claim 21, wherein multiple algebraic functions share the same work area.

23.   The program storage device in claim 22, wherein said multiple algebraic function share the same work area when one of:

said algebraic function match exactly;

said algebraic functions match partially; and

said algebraic functions have an intersection.

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24. The program storage device in claim 21, wherein said computing process comprises recomputing said algebraic function after one or more of said variables have changed.

25. The program storage device in claim 21, wherein said method further comprises estimating the error associated with said maintaining process.

26. The program storage device in claim 25, wherein said error relates to floating point number computations.

27. The program storage device in claim 21, wherein said method further comprises adding error variables to said work areas, wherein said error variables comprise estimates of the error in said variables.

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